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SEARCH REQUEST FORM

Requester's Full Name: LALITHA NAGUBANDI Examiner #: 82043 Date: 03/21/06  
Art Unit: 1621 Phone Number: 2-7996 Serial Number: 10/539,785  
Location (Bldg/Room#): REM/SD20 (Mailbox #): REM/C18 Results Format Preferred (circle): PAPER DISK  
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To ensure an efficient and quality search, please attach a copy of the cover sheet, claims, and abstract or fill out the following: 119

Title of Invention: Process for producing 1-Acetoxy-3-Substituted phenyl propene componin  
Inventors (please provide full names): Masashi Shirai, Yoshihiro Yoshida, Shinichiro Sadaike

Earliest Priority Date: December 18<sup>th</sup> 2003

Search Topic:

*Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known.*

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search for-

- ① a process producing 1-acetoxy-3(Substituted phenyl)propene  
Compound represented by str I in claim 1
- ② Compound search for str VI
- ③ Compound search for str X & XI
- ④ Pl. concentrate on claims 5-10; for process search

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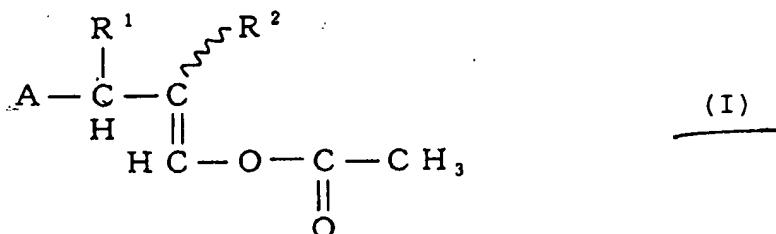
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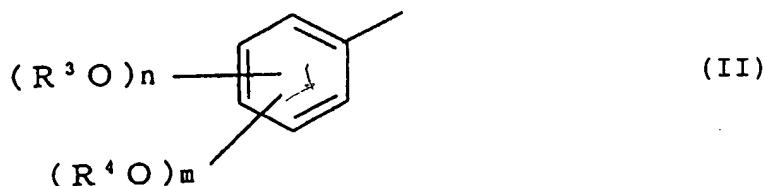
**CLAIMS**

1. A process for producing a 1-acetoxy-3-(substituted phenyl)propene compound represented by the general formula (I):

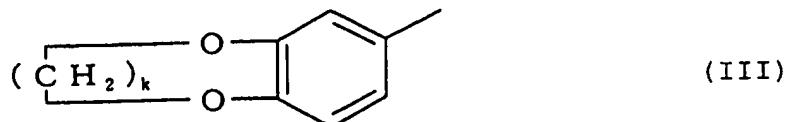
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in which formula (I), R<sup>1</sup> and R<sup>2</sup>, respectively and independently from each other, represent a member selected from the groups consisting of a hydrogen atom and alkyl groups having 1 to 10 carbon atoms, R<sup>1</sup> and R<sup>2</sup> may form, together with carbon atoms located in the 2- and 3-positions of the propene group, a cyclic group; and A represents a member selected from a group of substituted phenyl groups represented by the formulae (II) and (III):



and



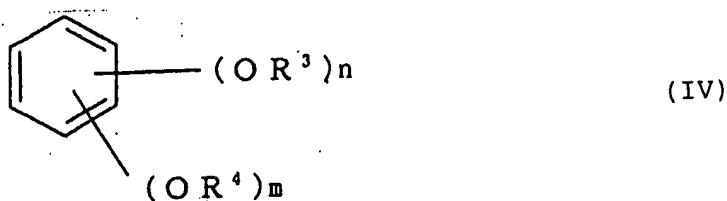
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35

wherein  $R^3$  and  $R^4$ , respectively and independently from each other, represent an alkyl group having 1 to 4 carbon atoms,  $m$  represents an integer of 0 or 1 to 4,  $n$  represents an integer of 1 or 5 and  $k$  represents an integer of 1 or 2, comprising reacting a benzene compound selected from

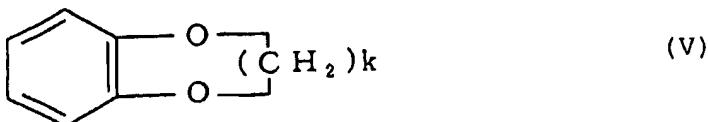
those represented by the general formulae (IV) and (V):

5



and

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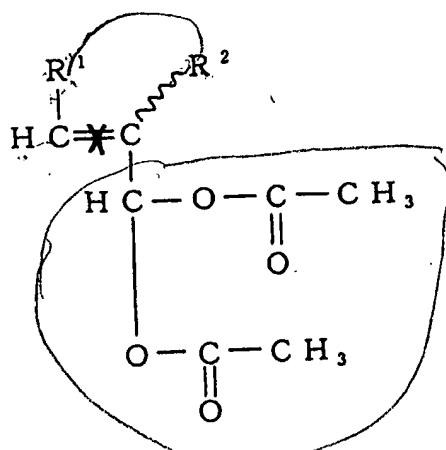


15

in which formula (IV) and (V),  $R^3$  and  $R^4$  and  $n$ ,  $m$  and  $k$  are as defined above, with a 2-alkenylidene diacetate compound represented by the general formula (VI):

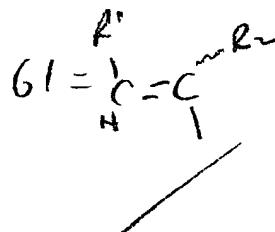
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(VI)



Rep 62 (1-10) A

in which formula (VI),  $R^1$  and  $R^2$  are as defined above, in the presence of a catalyst comprising at least one compound selected from the group consisting of (a) halogenated boron compounds, (b) triflate compounds of Group 11 elements of the Periodic Table, (c) halogenated compounds of Group 12 elements of the Periodic Table, and (d) triflate compounds and halogenated compounds of tin and lanthanoid elements of atomic numbers 58 and 66 to 71.

2. The process for producing a 1-acetoxy-3-

(substituted phenyl)propene compound as claimed in claim 1, wherein the benzene compounds represented by the formula (IV) is selected from the group consisting of anisole, veratrol, hydroquinone dimethylether, pyrogallol trimethylether and hydroxyhydroquinone trimethylether.

5       3. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the benzene compounds represented by the formula (V) is selected from the group consisting of 1,2-methylenedioxybenzene and 1,2-ethylenedioxybenzene.

10       4. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the alkenylidene diacetate is selected from the group consisting of 3,3-diacetoxy-2-methylpropene, 3,3-diacetoxy propene, 3,3-diacetoxy-1-methylpropene, 3,3-diacetoxy-2-ethyl propene, 3,3-diacetoxy-1-ethylpropene, and 3,3-diacetoxy-1-ethyl-2-methylpropene.

15       5. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the reaction is carried out in a molar ratio of the benzene compound to the alkenylidene diacetate compound of 1:1 to 50:1.

20       6. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the catalyst is present in an amount of 0.005 to 1 mole per mole of the alkenylidene diacetate compound.

25       7. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the halogenated boron compounds (a) usable for the catalyst are selected from boron fluorides, boron trifluoride-diethylether complexes, boron trifluoride-tetrahydrofuran complexes, boron trifluoride-acetic acid complex salt, boron trifluoride dihydrate, and boron trifluoride-n-buthylether complexes.

30       8. The process for producing a 1-acetoxy-3-

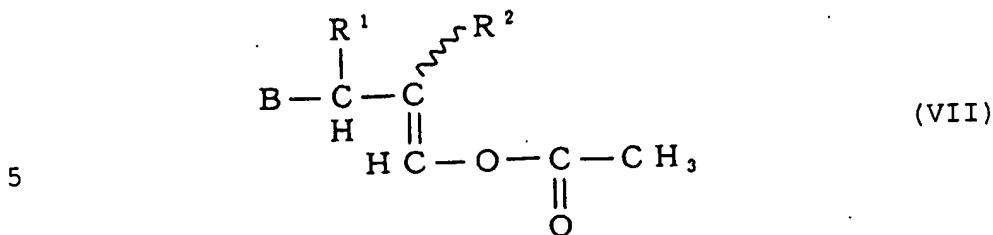
(substituted phenyl)propene compound as claimed in claim 1, wherein the triflate compounds (b) of Group 11 elements of the Periodic Table usable for the catalyst are selected from the group consisting of copper triflate and silver triflate.

5       9. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the halogenated compounds (c) of Group 12 elements usable for the catalyst are selected from the group consisting of zinc fluoride, zinc chloride, zinc bromide, zinc iodide, cadmium fluoride, cadmium chloride, cadmium bromide, cadmium iodide, hydrogen fluoride, mercury chloride, mercury bromide, and mercury iodide.

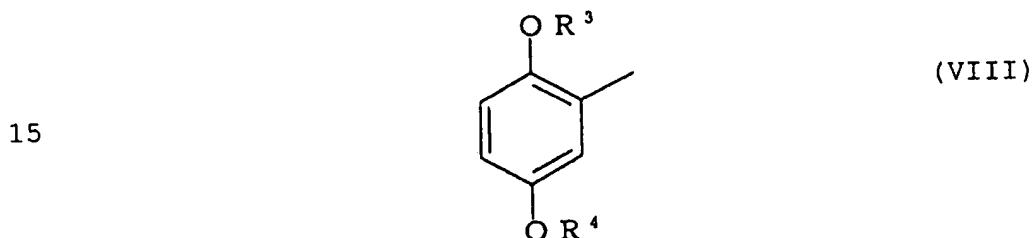
10      10. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 5, wherein the triflate and halogenated compounds (d) of tin and lanthanoid elements of atomic numbers 58 and 66 to 71 are selected from the group consisting of triflates, fluorides, chloride, bromides, and iodide of tin, cerium, dysprosium, holmium, erbium, thulium, ytterbium and lutetium.

15      11. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the reaction is carried out in an atmosphere consisting of a nonreactive gas to the above-mentioned compounds of the formulae (IV), (V) and (VI), the above-mentioned catalyst and the resultant reaction products.

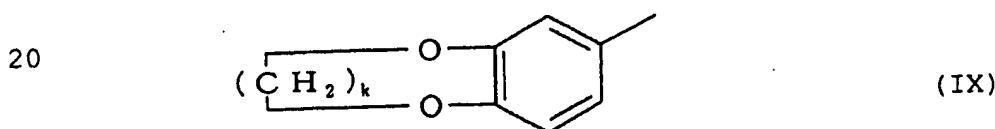
20      12. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the compounds of the formula (I) are selected from the compounds represented by the general formula (VII):



In which formula (VII), R<sup>1</sup>, R<sup>2</sup> are as defined above, B represents a member selected from a group of substituted phenyl groups represented by the formulae (VIII) and (IX):

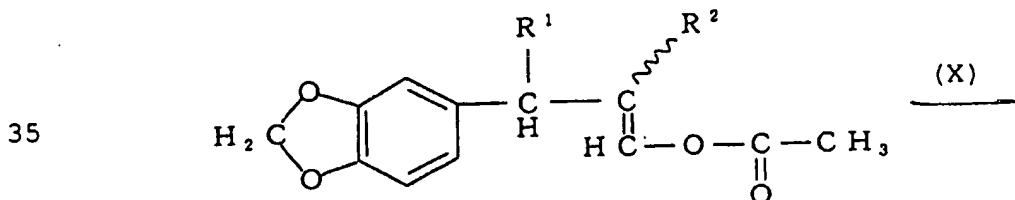


and

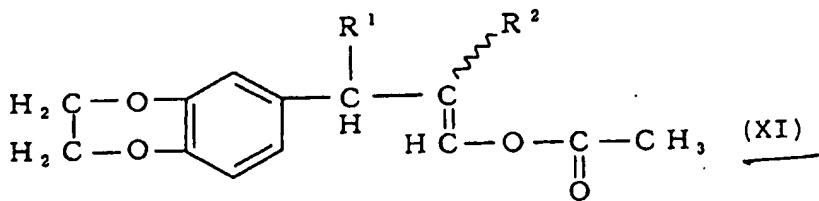


In which formulae (XIII) and (IX), R<sup>3</sup> and R<sup>4</sup> and k are as defined above.

13. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the compound of the formula (I) is selected from 1-acetoxy-3-(3,4-C1 to C2 alkylene dioxophenyl)propenes represented by the formulae (X) and (XI):



and



10 14. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 12, wherein in the formulae (X) and (XI), R<sup>1</sup> represents a hydrogen atom and R<sup>2</sup> represents a methyl group.

15 15. The process for producing a 1-acetoxy-3-(substituted phenyl)propene compound as claimed in claim 1, wherein the compound of the formula (I) is selected from the groups consisting of 1-acetoxy-2-methyl-3-(3,4-methylenedioxyphenyl)propene, 1-acetoxy-2-methyl-3-(3,4-ethylenedioxyphenyl)propene, 1-acetoxy-2-methyl-3-(4-methoxyphenyl)propene, 1-acetoxy-2-methyl-3-(2,5-dimethoxyphenyl)propene, and 1-acetoxy-2-methyl-3-(3,4-dimethoxyphenyl)propene.

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# FAST SEARCH

US 20050143599 A1 560/263	US-PPGPUB 20020627	Process for preparing monoesters Process for esterification in a chromatographic reactor	560/261
US 20020062039 A1 560/261	US-PPGPUB 20020523	Fluid bed vinyl acetate catalyst	560/261
US 20020028966 A1 560/234	US-PPGPUB 20020307	Process for the preparation of fluid bed vinyl acetate catalyst	560/261
US 20020022741 A1 560/234	US-PPGPUB 20020221	Metathesis syntheses of pheromones or their components	
US 20010056201 A1 525/328.9	US-PPGPUB 20011227	Process for the production of vinyl acetate	560/245
US 20010051690 A1 525/328.9	US-PPGPUB 20011213	Polymers of 3-butene esters, their preparation and use	
US 20010016666 A1 560/261	US-PPGPUB 20010823	PROCESS FOR THE PRODUCTION OF ESTERS FROM ALCOHOLS USING ACETIC ACID AS ACETYLATING AGENT AND CLAYS AS CATALYSTS	560/231
US 6987200 B2 560/241	USPAT 20060117	Process for producing catalysts comprising nanosize metal particles on a porous support, in particular for the gas-phase oxidation of ethylene and acetic acid to give vinyl acetate	
US 6982340 B2 560/241	USPAT 20060103	Process for producing an ester	554/142
US RE38864 E 560/241	USPAT 20051101	Process for making n-butyl esters from butadiene	
US 6900347 B2 560/261	USPAT 20050531	Impurity inhibition in olefin metathesis reactions	
US 6825149 B2 yield for production of vinyl acetate	USPAT 20041130	Highly selective shell impregnated catalyst of improved space time	
US 6818792 B2 US 6803182 B1	USPAT 20041116	Preparation of polymerizable compounds	560/218
emulsion grains with gallium complex composition, and gallium-doped silver halide emulsion	12	Gallium complex composition, process for doping silver halide	430/604
US 6696596 B1 560/245	USPAT 20040224	Catalyst and method for producing vinyl acetate	
US 6677495 B1 production and use thereof	USPAT 585/645	Oligomer mixtures derived from cyclopentene; method for the	

US 6605739 B1 ethylene oxidation	USPAT 560/245	20030812	10	Method for producing vinyl acetate monomer from ethane or
US 6602476 B2 422/146	USPAT	20030805	9	Apparatus and process for heat exchange with fluid beds
US 6540991 B2 US 6534434 B2	USPAT	20030401	5	Stabilized active materials
system	502/167	20030318	26	Chiral imidazolidinone-based catalyst composition and reaction
US 6506930 B1 US 6472555 B2	USPAT	20030114	7	Process for preparing alkyl (meth)acrylates
as acetylating and clays as catalysts	USPAT	20021029	9	Process for the production of esters from alcohols using acetic acid
US 6420595 B1 560/245	USPAT	20020716	36	Process control for vinyl acetate manufacture
US 6420308 B1 yield for production of vinyl acetate	USPAT	20020716	8	Highly selective shell impregnated catalyst of improved space time
US 6399813 B1 560/245	USPAT	20020604	14	Process for the preparation of fluid bed vinyl acetate catalyst
US 6395676 B2 502/330	USPAT	20020528	15	Process for the preparation of fluid bed vinyl acetate catalyst
US 6388042 B1 US 6376706 B2	USPAT	20020514	7	Dimethicone copolyol esters
560/241	USPAT	20020423	5	Catalyst and use thereof in the production of vinyl acetate
US 6348623 B1 560/261	USPAT	20020219	7	Polymers of 3-butene esters, their preparation and use
US 6348622 B1 560/260	USPAT	20020219	15	Vitamin a related compounds and process for producing the same
US 6322838 B1 US 6306943 B1	USPAT	20011127	10	Mint and/or fruit flavor compositions
US 6303537 B1 prepared utilizing sonication	USPAT	20011023	9	Zero volatile organic solvent compositions
US 6278031 B1 568/906	USPAT	20011016	6	Vinyl acetate catalyst comprising metallic palladium and gold and
		502/330		Catalyst and process for preparing 2-buten-1-ol compounds
		20010821		

US 6278016 B1 compounds	USPAT 560/261	20010821	Methods for conversion of isoprene to prenyl alcohol and related
US 6274531 B1 cupric acetate	USPAT 502/243	20010814	Vinyl acetate catalyst comprising metallic palladium and gold, and
US 6258978 B1 production of vinyl acetate	USPAT 560/248	20010710	Controlling product stream oxygen content in process for the
US 6252106 B1 560/261	USPAT	20010626	Method for stabilizing a sex pheromone compound
US 6228800 B1	USPAT	20010508	Noble metal support 502/339
US 6225496 B1 stream comprising acetic acid and water	USPAT	20010501	Process for the production of vinyl acetate utilizing a recycle
US 6215019 B1 560/234	USPAT	20010410	Synthesis of 5-decetyl acetate and other pheromone components
US 6191054 B1 device 438/780	USPAT	20010220	Method for forming film and method for fabricating semiconductor
US 6180821 B1 acid using a fluidized bed	USPAT 560/243	20010130	Integrated process for the production of vinyl acetate and/or acetic
US 6143921 A ethylene oxidation	USPAT 560/245	20001107	Method for producing vinyl acetate monomer from ethane or
US 6124270 A vaccine additive or drug	USPAT	20000926	Use of a cationic amphiphatic compound as a transfection agent,
US 6114573 A preparing vinyl acetate using the catalyst	USPAT	20000905	Catalyst, process for producing the catalyst and process for
US 611130 A derivatives 560/111	USPAT	560/261	Process for the preparation of trifluoromethyl containing
US 6107515 A 560/261	USPAT	20000822	Process for preparing methacrylic or acrylic esters
US 6107514 A gold deposited on a copper containing carrier	USPAT	20000822	Vinyl acetate production using a catalyst comprising palladium and
US 6072079 A 560/261	USPAT	20000606	Continuous process for the production of diacetoxybutene 560/245

US 6048471 A 252/364	USPAT 20000411	Zero volatile organic compound compositions based upon organic solvents which are negligibly reactive with hydroxyl radical and do not contribute appreciably to the formation of ground based ozone
US 6040474 A 560/261	USPAT 20000321	Integrated process for the production of vinyl acetate and/or acetic acid
US 6034268 A 560/261	USPAT 20000307	8-Ocimethyl esters and fragrances and flavors containing the same
US 5891921 A preparation thereof	USPAT 19990406	Quaternary ammonium carboxylate and borate compositions and
US 5886214 A optical purity	USPAT 19990323	Process for the production of chiral unsaturated alcohols in high
US 5872277 A USPAT	19990216	Methods for preparing prenyl alcohol
US 5859287 A USPAT	19990112	Process for preparing vinyl acetate utilizing a catalyst comprising
palladium, gold, and any of certain third metals	560/241	
US 5821384 A 560/231	USPAT 19981013	Process for generating vinyl carboxylate esters
US 5783726 A 560/261	USPAT 19980721	Process for the preparation of vinyl acetate catalyst
US 5744637 A 560/238	USPAT 19980428	Carboxylic acid accelerated formation of diesters
US 5731456 A USPAT	19980324	Preparation of vinyl acetate
US 5728376 A USPAT	19980317	560/238 Tetradecatrienyl and tetradecadienyl acetates and their use as sex
attractants for tomato pests	424/84	
US 5708167 A 540/485	USPAT 19980113	Method for the preparation of an N-vinyl compound
US 5665667 A 502/300	USPAT 19970909	Process for the preparation of vinyl acetate catalyst
US 5607670 A USPAT	19970304	Sex attractant for the cranberry fruitworm
US 5589548 A polyolefins	USPAT 19961231	424/84 Process for preparing difunctional telechelic linear non-crosslinked
	525/247	

US 5536693 A 502/300	USPAT	19960716	Process for the preparation of vinyl acetate catalyst
US 5502243 A	USPAT	19960326	Hydrocarbonylation of dimethyl ether
US 5466652 A 502/330	USPAT	19951114	Process for the preparation of vinyl acetate catalyst
US 5430179 A	USPAT	19950704	Homogeneous process for the ruthenium catalyzed addition of carboxylic acids to alkynes
US 5380901 A 556/440	USPAT	19950110	Multifunctional acrylates and the synthesis thereof
US 5296220 A	USPAT	19940322	Cockroach attractant
US 5294733 A	USPAT	19940315	Organic compositions and their manufacture
US 5280048 A	USPAT	19940118	.beta.,.gamma.-dihydropolypropenyl alcohol derivatives and pharmaceutical composition containing a polypropenyl compound
US 5254714 A	USPAT	19931019	Hydrogenation of aromatic-substituted olefins using organoruthenium catalyst
US 5243099 A	USPAT	19930907	Synthesis of alpha-substituted alkadienes
US 5236715 A	USPAT	19930817	Sex attractant for the mint root borer
US 5231221 A	USPAT	19930727	Process for the preparation of acylals
US 5227517 A 560/238	USPAT	19930713	Process for preparing ethylidene diacetate using iodide catalysts
US 5202465 A 560/261	USPAT	19930413	Preparation of 2-methylenepropane-1,3-diol dicarboxylates
US 5196571 A	USPAT	19930323	Preparation of unsaturated monoesters
US 5169981 A	USPAT	19921208	6 Synthesis of alpha-substituted alkadienes
US 5169867 A	USPAT	19921208	8 Hydroxylamine compounds
US 5166379 A use 554/224	USPAT	19921124	10 Synthesis of compounds with biological activity, and methods of
US 5155253 A	USPAT	19921013	19 Transvinylation process for the preparation of thermally labile vinyl compounds and for vinyl compounds prepared from thermally labile acids
US 5149843 A	USPAT	19920922	16 Conjugated diene compounds
US 5118837 A	USPAT	19920602	10 Selective hydrogenation of olefins

US 5095134 A	USPAT	19920310	9	Thermochromic diacetylene ethers containing ester or urethane
groups	560/24			
US 5089659 A	USPAT	19920218	4	Preparation of E7/Z9-alkadien-1-ols and their derivatives protected at the hydroxyl group
at the hydroxyl group	560/238			
US 5081083 A	USPAT	19920114	32	Method of treating intermetallic alloy hydrogenation/oxidation catalysts for improved impurity poisoning resistance, regeneration and increased activity 502/50
US 5077046 A	USPAT	19911231	28	Polypropenyl composition or compounds and process for the production thereof
US 5073572 A	USPAT	546/290		
514/739	USPAT	19911217	7	Bioactive metabolites from cribrochalin vasculum
US 5072029 A	USPAT	19911210	5	Catalyzed process for reacting carboxylic acids with vinyl ethers
560/225				
US 5026903 A	USPAT	19910625	6	Production of ethylidene diacetate from dimethyl acetal
560/232				
US 4994087 A	USPAT	19910219	9	Compounds containing substituted phenylamino and pyridyl groups and hair dyeing preparations using them
US 4992609 A	USPAT	19910212	11	Phosphonium salts and processes for production of and uses for the same 585/509
US 4978778 A	USPAT	19901218	12	Process for producing vinyl acetate 560/261
US 4970334 A	USPAT	19901113	9	Process for preparing esters of unsaturated alcohols
560/261				
US 4965376 A	USPAT	19901023	4	3,9-dihydroxynynone and its derivatives protected at the 9-OH function 549/423
US 4943397 A	USPAT	19900724	6	Metathesis of functional olefins 560/201
US 4943396 A	USPAT	19900724	5	Process for preparing linear alpha, omega difunctional molecules
560/201				
US 4924026 A	USPAT	19900508	31	Triisobutylene alcohols and esters, uses thereof in perfumery and halogenated intermediates useful for preparing same
US 4912253 A	USPAT	19900327	5	Method for the preparation of an unsaturated alcohol or ester thereof 560/261

US 4910321 A 549/213	USPAT	19900320	15	Living catalysts, complexes and polymers therefrom
US 4902824 A	USPAT	19900220	5	Dispersant for vinyl acetate unit fouling
US 4886904 A	USPAT	19891212		Polyisoprenyl composition or compounds and process for the
production thereof				
US 4843178 A 568/469.9	USPAT	19890627		Compositions possessing pheromone-like activity
US 4843170 A	USPAT	19890627		Process for producing vinyl acetate
US 4837358 A	USPAT	19890606		Preparation of 9-alkenyl ester compounds
US 4827004 A	USPAT	19890502		Isoprene derivatives
US 4818442 A	USPAT	19890404		Disproportionation process
US 4812509 A	USPAT	19890314		Esters and polyesters from cyclopentadienylethanol and bis(2-hydroxyethyl)dicyclopentadiene
US 4806679 A	USPAT	19890221		Isomerization of diacyloxybutenes
US 4801738 A	USPAT	19890131		Preparation of $\delta$ . $\delta$ . $\delta$ . $\delta$ .formylvalerates
US 4791222 A	USPAT	19881213		Process for preparing dihydromyrcenol and dihydromyrcenyl acetate
US 4789750 A vitamin E 549/407	USPAT	19881206		2-(trimethyl-trideceny)-tetramethylchroman intermediates for
US 4780542 A 548/261	USPAT	19881025		Process for the synthesis of esters and amides of carboxylic acids
US 4740627 A	USPAT	19880426		Synthesis of E,Z-11-tetradecen-1-al
US 4734524 A 560/265	USPAT	19880329		Synthetic pheromone 8-methyl-2-decanol propanoate
US 4691053 A	USPAT	19870901		Process for producing organic compounds by utilizing oxygenic complexes
US 4665221 A	USPAT	19870512		Preparation of terpenoid formates
US 4658071 A	USPAT	19870414		Preparation of olefinically unsaturated compounds in particular alkenols
US 4658053 A	USPAT	19870414	3	Production of esters
				560/234

US 4650896 A 560/112	USPAT	19870317	5	Preparation of 2-alkyl-4,4-diacyloxybut-2-enals
US 4629586 A 510/107	USPAT	19861216	23	Hexynyl alkanoates and organoleptic uses thereof
US 4618704 A	USPAT	19861021	5	Acyloxy-2-butenes and their preparation
US 4615838 A	USPAT	19861007	6	Unsaturated compounds and their preparation
554/224				
US 4613457 A	USPAT	19860923	3	2-methyl pentanoic acid esters and perfume compositions
containing them				
US 4599469 A	USPAT	19860708	8	Hydrogenation process
US 4571408 A	USPAT	19860218	8	.alpha.,beta.-Dihydropolypropenyl derivatives for treating hepatitis
514/546				
US 4560792 A	USPAT	19851224	10	Disproportionation of functional olefins
US 4560776 A	USPAT	19851224	45	Prins reaction products of diisoamylene, derivatives thereof,
organoleptic uses thereof and processes for preparing same				
US 4539209 A	USPAT	19850903	23	549/356
US 4536188 A	USPAT	19850820	3	Food flavoring use of hexynyl alkanoates
US 4529132 A	USPAT	19850716	4	Alcohol compositions having luminous flames
copolymer waxes				
US 4525298 A	USPAT	19850625	20	Process for preparing free-flowing ethylene homopolymers or
ingredients				
US 4521342 A 554/163	512/26	USPAT	19850604	4
US 4520213 A	USPAT	19850528	6	Aliphatic alcohols and esters and their use as perfuming
water				
US 4517377 A thereof	568/913	USPAT	19850514	6
US 4510319 A	USPAT	19850409	12	Process for producing vinyl acetate
560/256				
US 4501918 A	USPAT	19850226	36	Functionalization of terminal trisubstituted alkenes and derivatives
organoleptic uses thereof and process for preparing same				
US 4501687 A	USPAT	19850226	7	Substituted methyl isopropyl oxocyclohexane derivatives,
				560/231
				Cyclopentanols
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US 4499297 A 560/231	USPAT	19850212	4	Process for the preparation of alkylated cyclopentenones
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US 4469703 A	USPAT	19840904	10	Nitroalkanol derivatives and plant protecting agents containing the
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